

Mid-Atlantic Region Geographic Information Systems Workshop

July 29–30, 2008 — Towson, MD



ALL HAZARDS CONSORTIUM



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April 1, 2009

Greetings from the All Hazards Consortium Board!

It is with great pleasure that the All Hazards Consortium is able to announce the release of this Regional Geographic Information Systems (GIS) White Paper. This represents the fifth such regional white paper that once again establishes common agreement across our member states on an important regional topic.

The basis of this white paper was formed at our Regional GIS Workshop at Towson University in July 2008. Nine states came together to discuss their current GIS efforts and the role that GIS plays in the Homeland Security/Emergency Management efforts. Since that time, the GIS representatives around the region, as well as the AHC working group members on the Emergency Management Working Group, have worked together to finalize this important document.

This document represents yet again another collaboration effort of the nine (9) consortium states with stakeholders from industry, higher education, non-profit and federal government partners. Going forward, this document will be used to help the states in their planning efforts, grant activities and overall coordination efforts in important issues facing the region, including, information sharing, evacuation planning, communications interoperability, critical infrastructure protection / interdependencies and many of the future topics the AHC will be addressing in 2009 and 2010.

I would like to thank all our participants and partners who helped with this effort, many are listed in the white paper, but there are many hundreds of others who have helped with the Consortium's efforts over these past four (4) years.

I am truly honored to be a part of this organization and to partner with my fellow Homeland Security Advisors and Emergency Management Directors from around the region. We are proud to release this important new document as we move the ball forward to improve protection for our citizens, increase awareness and enhance overall public preparedness.

Many thanks,

Sincerely

Robert Crouch
President
Board of Directors
All Hazards Consortium

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MESSAGE FROM THE ALL HAZARDS CONSORTIUM

The All Hazards Consortium (AHC) is a 501c3 organization guided by state government and comprising public and private sector stakeholders focused on regional homeland security and emergency management collaboration within the Mid-Atlantic region and surrounding states. This is a unique model for regional public/private collaboration. Conceptualized in 2003 by the states of Virginia and Maryland and the District of Columbia, the AHC was created to provide a framework to engage partners within state and local government, business, and higher education to share information and collaborate on potential regional requirements, studies, projects, and solutions. Member states or jurisdictions include Delaware, District of Columbia, Maryland, New Jersey, New York, North Carolina, Pennsylvania, Virginia, and West Virginia. The AHC also includes federal agencies in support of the states and private sector firms, higher education, and nonprofit organizations.

We are proud to support the fifth workshop of this kind among the states. This meeting focused on the role of Geographic Information Systems (GIS) within each of

the participating states and the application of GIS in support of emergency management/homeland security programs within the region. The AHC believes that improved preparedness and response capabilities depend upon our nation identifying issues and requirements at the local and state levels and planning, in concert with federal efforts, at the regional level. Each of the states has developed a robust GIS capability. The challenge is to more fully apply this capability to the emergency management/homeland security programs within each state and to explore and develop an appropriate application of GIS within a regional context. GIS is seen as an important component of regional efforts and may serve as a catalyst to bring together the various state agencies who must coordinate during a catastrophic event.

The AHC acknowledges the member states and jurisdictions, their local stakeholders, and their supporting federal, private, and academic partners, who all share a sincere desire to protect residents and communities while working in concert with their respective neighbors.

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EXECUTIVE SUMMARY

Emergency management and homeland security officials within the Mid-Atlantic region are faced with a host of issues that require engagement with a wide variety of people and agencies, participation in varied processes, and utilization of various technologies in order to address the issues effectively. Geographic Information Systems (GIS) are an important technology that can support a number of issues in many different sectors of government and industry. As with any technology, bringing the user community of emergency managers and homeland security officials together with the representatives of the GIS community is an important step in the process. As is often the case, these groups have different perspectives to offer on the same topic.

This white paper summarizes ideas, issues, and needs generated at the Regional Geographic Information Systems Workshop on July 29 and 30, 2008, by representatives of the Mid-Atlantic states or jurisdictions of Delaware (DE), District of Columbia (District), Maryland (MD), New York (NY), North Carolina (NC), Pennsylvania (PA), Virginia (VA), and West Virginia (WV). New Jersey (NJ) was not able to attend the workshop in July but provided valuable input during teleconferences.

The All Hazards Consortium (AHC) regional GIS Workshop was designed to address the following objectives:

- Explore the role of GIS in supporting the region's catastrophic evacuation planning efforts from the emergency management and homeland security perspective.
- Provide a multistate update on the status of GIS topics, including funding, policy, tools, needs, recommendations, solutions, governance, data sharing, etc.
- Produce a regional white paper that outlines issues discussed and also develops regional needs/recommendations for use by AHC stakeholders to draft GIS solutions and possibly attract resources, partnerships and funding downstream.
- Develop a portfolio of pre-approved "multistate project ideas" that can be funded to support the needs of the regional white paper needs and recommendations at both the state and federal level.
- Work toward developing sustainable GIS data-sharing standards, policies, and systems to serve all-hazards needs and related efforts.

Analysis of the data generated prior to and during the workshop indicates that each of the participating states or jurisdictions has a fairly robust GIS program and capability at the state level. However, the integration of GIS into emergency management/homeland security programs varies from jurisdiction to jurisdiction. In several cases, a focused effort to integrate GIS into these programs has only been underway for several years.

Other areas identified that need additional resources and effort include data sharing among local, state, federal, and private sector owner/operators within the region; developing and promoting the use of the analytical and modeling capabilities of GIS as a component of an organizational framework rather than seeing GIS as a tool to produce images; and the need to more fully integrate GIS into emergency preparedness training and exercises.

A number of the workshop speakers emphasized the need for and benefits of developing partnerships and personal relationships among local, state, federal, and private sector partners within the region.

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REPORTS BY STATES

The following section highlights current and planned GIS development within the states/District and GIS use by emergency management/homeland security programs. It also identifies some of the challenges, capability gaps, and requirements faced by these jurisdictions. The information was provided by the states and the District during a series of conference calls and during the workshop itself.

Delaware

Presenter: Mr. Michael Mahaffie
State GIS Coordinator, Delaware Office of Management and Budget

Mr. Mahaffie said GIS tools and spatial data should be an integral part of planning for catastrophic events. Emergency managers need to share their knowledge of what information is needed and used to support their mission with GIS managers. A major challenge is training the emergency management community on what is available from the GIS community and training the GIS community on what the emergency management community needs to support all aspects of its programs.

States need to establish clear data stewardship roles to make sure that data are published and shared as appropriate. For example, an agreement was worked out with Tele Atlas that some parts of that vendor's data set for Delaware should be public information, while other attributes needed to be pulled out before making the layer publicly available.

Mr. Mahaffie stated that everyone needs access to the same data so that they can start building useful applications. Imagery, standardized addressing, and transportation are key datasets for use at the regional/national level. Rather than focusing on developing national data coverage to be

maintained at a national level, perhaps the emphasis should be on developing national standards to support local data management.

He noted that it is important that normal business practice be continued while either major entertainment events such as a NASCAR race or catastrophic events are occurring.

Mr. Mahaffie pointed out that it is beneficial to build on existing coordination structures and leverage existing relationships while matching efforts to the most appropriate level of geography. This requires a level of sensitivity and respect.

He concluded by saying that partnerships are a leap of faith and that the keys to success are community, teamwork, partnership, and respect.

District of Columbia

Presenter: Mr. Barney Krucoff
GIS Director, District of Columbia, Office of the Chief Technology Officer

Mr. Krucoff stated that the District has a bit of an advantage because it uses GIS every day rather than just during events. District participants are essentially "Living our Vision" on a daily basis.

The District GIS helps all agencies with GIS technology response. District GIS staff work directly in the centers. They are physically located at the agencies and work with agency personnel.

Mr. Krucoff noted that one of the challenges that the District GIS staff face is that there are many users in many agencies to coordinate with including the federal government. For example, on the topic of evacuations, he said that the District is evacuated every day. Even a major incident usually would not call for a total city

evacuation. Yet the expectation to support planning for catastrophic evacuation is present.

Mr. Krucoff observed that a regional group, like the National Capital Region (NCR), has limited political authority. It is the member states/counties that have the legislative and regulatory authority.

He said that it is a common practice to share data with other counties and regionally, but not through formal agreements. Due to open records laws, it would be difficult legally to get all of the involved to concur with a common agreement.

According to Mr. Krucoff, a major question is, “Whose job is it to build partnerships/relationships and keep them going?” The Urban Area Security Initiative (UASI) program funded a Data Exchange Hub for the NCR. There are questions about who is in charge and who establishes it. There is a need for standard operating procedures (SOPs).

Mr. Krucoff noted that the District has adequate live data and web services that are easily ported over to other applications.

He said that the District is using GIS to support activity within the Emergency Operations Center (EOC). However, there is a need to get GIS-based information that is available in the EOC into the hands of the people who are in the field and need that information (e.g., law enforcement, emergency medical technicians [EMTs], and firefighters). In the past, an issue was the lack of computers in the field. Now issues include the need for meaningful data, understanding of backend systems, automation (live updates), and government coordination. One solution may be implementing a Google Earth–based setup, just for viewing current/recent data displayed in the EOC.

Mr. Krucoff concluded by emphasizing that the issue is the same at the county, state, regional, and national levels — the need for datasets.

Maryland

Presenter: Mr. Kenneth Miller
Geographic Information Officer, Maryland
Department of Natural Resources

Mr. Miller said that we need to recognize the importance of using geospatial capabilities to meet emergency management mission requirements and needs. We must also recognize the need for widespread access to geospatial data and analysis among various state agencies.

Data currency is always an ongoing challenge; decisions must be based on timely data. Data-sharing agreements, training, and standards have not been formalized among all partners.

Mr. Miller said that the GIS community must provide GIS training and outreach to the emergency management community. The GIS community has relationships with other state agencies and universities, and these relationships are leveraged to enhance efforts. One example is that local communities and the state are sharing in geospatial data purchases.

Mr. Miller observed that no multistate GIS applications or agreements are known to exist formally/informally. However, the Emergency Management Mapping Application (EMMA[®]), developed by the Towson University Center for GIS, is being used by several neighboring states (i.e., Virginia, the District, and Delaware) and could be a potential foundation for such agreements.

He said that Maryland is engaging in several successful partnerships, including the EMMA[®] partnership (with Towson University, Maryland Department of Transportation [MDOT], and Department of Homeland Security [DHS]), the statewide imagery partnership, and state base map (MD iMap). Keys to successful partnerships include leadership execution, shared needs and goals, shared funding and resources, and trust.

He said that there is a need to build statewide data partnerships for systems and databases that are shared with appropriate partners (i.e., federal, private). This data partnership should deploy a central, authoritative data repository (i.e., MD iMap).

Mr. Miller observed that in a catastrophic event, it would be difficult to envision successful, seamless data sharing occurring among the state and necessary parties. GIS is a solution to this issue.

He said that there is a need for the emergency management community to embrace GIS technology. Doing so could be the basis for forging formal data and resource-sharing partnerships with federal agencies and neighboring jurisdictions.

Mr. Miller said that it is important to exercise and train with partners and data that would be used in an actual emergency.

New Jersey

Interviewee: Mr. William Chavan
GIS Specialist, New Jersey Office of
Homeland Security & Preparedness

A representative from the State of New Jersey was not able to attend the workshop in July. However, Mr. Chavan provided input to the White Paper during a telephone interview on December 10, 2008.

Mr. Chavan explained that the New Jersey Office of GIS coordinates statewide GIS efforts through the Geographic Information Council, which includes one member from each state agency that is currently utilizing GIS. The New Jersey Geospatial Forum (NJGF) establishes a formal mechanism by which its members can be carried through the state's governance structure to decision makers at the appropriate levels. Membership in the NJGF is open to anyone in the state, public, or private sector who shares a common interest in geographic information and technology.

Mr. Chavan explained that New Jersey uses Emergency Support Functions (ESFs) to prepare for and respond to major incidents. New Jersey's goal is to incorporate GIS, wherever beneficial, within all 15 ESFs.

Mr. Chavan said that keeping data current is essential and can be a challenge in a dynamic environment. Funding, prioritization, staffing changes and available resources can all have an impact on the maintenance of data. Data-sharing agreements are a significant step toward breaking down the "silos" and allowing access to vital information. Relationships formed among the state personnel should facilitate critical communications.

Mr. Chavan suggested that a regularly scheduled teleconference of state emergency management and homeland security GIS staff be setup and could serve as a forum for the state personnel to share information about their current activities; to identify areas of common interest, best practices, and lessons learned; and, to develop effective working relationships among the participants.

Mr. Chavan spoke about the state's Special Needs Population Registry as a successful initiative. He said that people with special needs can register on the New Jersey Ready website, and the data are tied to a statewide GIS program that is available to emergency management officials.

Mr. Chavan explained that New Jersey has geocoded designated shelter facilities and resource locations within the state. The resource locations are linked to a resource database directory, which maintains the resources available at each location. This data can be accessed via a GIS application.

Mr. Chavan stressed the importance of building and maintaining relationships within each state, but also among the states that comprise the AHC. He said that successful partnerships are based on relationships. He identified four characteristics associated with successful partnerships:

- Buy-in from agency management,
- Feeling a sense of ownership,
- Data returned (if requested) to facility owner in a GIS project, and
- Open communication among partners.

New York

Presenter: Mr. William F. Johnson
Assistant Deputy Director, Operations, NYS
Office for Cyber Security & Critical
Infrastructure Coordination

Mr. Johnson stated that more can be learned about GIS implementation through exercises and emergency activations than by responding to a set of questions.

He said that political leaders and decision makers are more open to new ideas and technology when there is potential for crisis, such as before Y2K.

Mr. Johnson pointed out that GIS equipment, such as computers and plotters, need to be portable in order to be deployed in an exercise or emergency. Live data also need to be available.

He said that users need to know what attributes mean and what layers represent. There is a need for metadata and data dictionary look-up tables for coded values. It is not good enough to just provide access to data. Otherwise, GIS will not be a useful tool for them.

Mr. Johnson observed that data owners control and manage their own data. He said that the state's established manner for data sharing is to share this data in its native format.

Mr. Johnson pointed out that GIS functions go far beyond mapping. Querying functionality/attribute information is necessary to get the most leverage out of GIS.

Mr. Johnson noted that separate instances of a GIS application can be set up for different groups or agencies. Alternately, an existing application can be scaled up for everyone's use.

Mr. Johnson discussed what datasets can or should be made public and who should decide this. He said that in New York, the state Office of Homeland Security has the final say after thoroughly considering Freedom of Information Law issues, security issues, and policy issues on licensing and/or cost recovery. Generally, base map datasets are released openly, but the state GIS office defers to the state agency that is the steward of requested data.

He also noted that data become outdated quickly, or there can be redundant or differing versions of the same data. In New York, data-owning agencies push updates to the state's secure, web mapping application, Critical Infrastructure Response Information System (CIRIS). The updates are handled via an online, automated upload process. However, if a dataset is new, the update process is more manual.

Mr. Johnson described the importance of CIRIS to New York's strategy for supporting

emergency response and homeland security users with a sophisticated GIS capability that contains over 500 datasets at state, local, and federal levels. He felt that CIRIS addresses most of the issues discussed at the workshop and believes that it is a potential model for regional collaboration.

North Carolina (NC)

Presenter: Mr. Kenneth Ashe
Assistant Director of Geospatial Technology Management, North Carolina Emergency Management Agency

Mr. Ashe stated that the current focus of the North Carolina GIS effort is primarily on developing and working with data within the state. North Carolina is using GIS as an integral component that supports “A State Prepared,” through a real-time common operating picture. Three GIS staff serve as part of the state Emergency Operations Center Command Staff and use Web EOC® to disseminate information to support georeferenced decision making.

Mr. Ashe said that North Carolina uses a pre- and post-disaster data collection manual to document the pre- and post-event data required for disaster response, its collection process, standards, and its use for GIS-based map products and analysis.

He noted that rapid growth in some counties presents a challenge for data upkeep and maintenance.

Mr. Ashe observed that a lack of cooperation and coordination of effort as a result of interagency infighting and “turf wars” can limit the quality and depth of data available and can result in redundant effort.

He also noted that lack of understanding GIS is a challenge. In some cases, there seems to be a lack of knowledge of what

data can do or offer. In other cases, there seems to be closed thinking.

Mr. Ashe stated that there is no one set of data standards. North Carolina has found that it is often better with a basic data set so that people can apply their needs to the data. Users only need an “ID” to access the files.

Mr. Ashe said that consumers of GIS products range from senior elected and appointed leadership who may need high-level decision support information to first responders who may need highly detailed information about a very limited area. Once the range of needs is understood, the GIS capabilities need to be developed to meet them.

Pennsylvania

Presenter: Ms. Stacey White
GIO, Geospatial Technologies Office, Governor’s Office of Administration, Office for Information Technology

Ms. White stated that GIS is a way to unify disparate information and to get the “big picture” that can’t be gained from disparate data.

She said that governance structure is important and has to change along with technology and as different people come and go within an organization. Different advisory committees should be part of the governance.

An enterprise GIS database is at the core of the Commonwealth’s GIS vision. All data, applications, tools, etc., are part of, or link back to, this central database. This would also cut down on redundant GIS work across or within Commonwealth agencies.

Ms. White observed that in emergency management, the best data are at the local level. She said that metadata are vital

because emergency managers need to be sure of the data's validity and intended use in order to apply them effectively.

Ms. White stated that two-way data sharing between the Federal Emergency Management Agency (FEMA) and the Commonwealth is needed during Stafford Act responses. The Commonwealth would like real-time access to the data being collected by FEMA. FEMA has concern about the sensitive nature of its data (i.e., residents' personal information). As a result, data and mapping created by the Commonwealth are redundant in some cases.

Ms. White pointed out that funding must be sustainable. Grants are available to fund initial GIS costs, but there must be additional funding to continue.

She concluded by pointing out that building good relationships between states and agencies is vital.

Virginia

Presenter: Mr. Brian Crumpler
GIS Manager, Virginia Department of
Emergency Management

Mr. Crumpler stated that GIS is already being used to support catastrophic planning for hurricanes, evacuation planning, and radiological emergency planning (i.e., nuclear power stations) in Virginia.

However, he noted that GIS is a relatively new addition within emergency management in Virginia but has increasingly been used over the past two to three years. Historically, GIS has been seen as a "tool" for emergency management rather than a major component within a "framework" for emergency management.

Mr. Crumpler stated that the localities within the VA Commonwealth coordinate with the

Virginia Geographic Information Network (VGIN) to develop statewide enterprise framework datasets (such as imagery, road centerlines, and elevation datasets) and data. However, since Virginia is a Commonwealth and has more than 130 jurisdictions, the GIS environment is federated within the state. This provides unique challenges for coordinating datasets and tools. However, this also provides a larger pool from which innovative GIS solutions can be developed.

He added that regionally, GIS applications have generally not been used across state borders. However, regional data sharing does occur, albeit manually. This mirrors much of the data sharing that occurs at the local level as well, where manual data sharing has historically been the means for sharing geospatial information. He also noted that there is GIS coordination with federal partners, such as FEMA Region III and the Virginia U.S. Geological Survey (USGS) Liaison.

Mr. Crumpler pointed out that conducting exercises utilizing GIS is important to the successful application of GIS and geospatial data during actual emergencies.

Mr. Crumpler observed that it has historically been easier to obtain buy-in for technology (applications) than for the data management and process analysis required to support successful technological solutions.

Mr. Crumpler noted that sharing data regionally has encountered several information technology (IT) related challenges, including, coordination between partners; adequate resources and funding; and, existing IT procedures sometimes have not been developed with GIS in mind. There is a need to get more people thinking about the role and purpose of GIS, not just GIS staff.

He said that there is a need to develop and enhance formal data and resource-sharing relationships with other partners at all levels of government. There is also a need to develop an enterprise platform for deployment of data and services.

Mr. Crumpler said that it is also important to improve the geospatial data coordination for emergency management by focusing on key themes within emergency management: hazard identification, planning, demographics and facilities, and operational datasets. Also, there is a need to create a framework for geospatial operations (including SOPs) to support major local and regional incidents.

West Virginia

Presenter: Ms. Katherine Kapo
West Virginia GIS Coordinator

Ms. Kapo said that there is collaboration between the GIS community and the emergency management community in West Virginia. Emergency management uses GIS to support resource management and to identify what attributes are needed for resource data. Although emergency management is currently using GIS as a data delivery tool, it is moving toward using GIS as a modeling tool.

Ms. Kapo noted that data standards currently are not well established or communicated across the region. There is also a need for verification of data exchange protocols. Currently, there are no defined protocols for sharing data on a regional scale. However, data are available when needed in an emergency situation, and West Virginia Department of Military Affairs and Public Safety GIS personnel are ready and willing to contribute as needed.

She stated that it is important to improve state staff training to support more advanced uses of GIS analytical

capabilities, such as modeling, on a day-to-day basis.

Ms. Kapo pointed out that local government was able to verify key resource and critical infrastructure data attributes.

While a majority of GIS effort is focused within the state, the West Virginia Department of Environmental Protection is involved in the creation of a national-scale active coal mine permit boundary data layer and is sharing data electronically with the Virginia Department of Mines and Minerals and the U.S. Department of the Interior's Office of Surface Mining.

Ms. Kapo discussed West Virginia's Catastrophic Event Evacuation Management Project (CATEVAC). The project was initiated by the West Virginia Department of Military Affairs and Public Safety and involves partners from West Virginia University (WV GIS Technical Center) and various agencies and organizations.

She said that the CATEVAC project is designed to identify the location of resources needed to manage the ingress of people from urban areas like Washington, DC; Baltimore, Maryland; and/or Pittsburgh, Pennsylvania in the event of a major urban evacuation. The project is also intended to facilitate improvements and training in event and consequence management to convey the impact of decisions and actions within and across jurisdictions along the evacuation routes.

In the future, it is hoped that additional analytical tools can be built into the project and that other variables, such as behavioral characteristics, demographics, and travel time, can be incorporated.

Ms. Kapo pointed out that data sharing and collaboration among agencies within the state has been successful (although informal at present) due to good interpersonal relationships.

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REPORTS BY TOPICS

During the workshop, the states and the District gathered to discuss their efforts regarding GIS development within the states/District and GIS use by emergency management/homeland security programs. After the state reports, breakout sessions were held that provided the participants with an opportunity to exchange ideas and discuss a number of topics.

Common Operating Picture

State representatives pointed out that, all too often, a “Common Operating Picture” means different things to different users. It seems to be seen through one’s own lenses and defined to meet one’s own needs. One participant observed that if everyone has his or her own common operating picture, how then is it “common”?

It was pointed out that there seems to be a need for a glossary or an understanding of terms and common definitions like “common operating picture,” that have different meanings to individual users, emergency managers, technicians, and agency directors.

There is a need to have an understanding of each state’s definition of common operating picture, data used, data shared, applications used, applications shared, any gaps that exist, and symbology used. There seem to be many definitions and components. Because of this, one representative stated that a line needs to be drawn in the sand, and a name and its meaning supplied.

The question was raised concerning the best way to distribute a common operating picture to the public. One suggestion was to broadcast timely/real-time data through radio and/or television.

Another participant asked whether it was a realistic expectation to establish the

standards needed to support a common operating picture? Is it an issue of perfection vs. practicality? Does a system have to be “perfect” as long as it is functional?

It was suggested that one key purpose of a common operating picture was to support making good, timely decisions.

It was recommended that the goal be to develop more of a common operating infrastructure rather than focus on a common operating picture. We should focus on building data infrastructure, not on building applications.

Data Sharing

In a Post 9-11 Environment

Following the 9-11 attacks, there has been a more focused effort by all levels of government to gather and organize information about private and public key resources and critical infrastructure. This has been done to mitigate identified vulnerabilities and to prepare more effective response and recovery plans. Also, following 9-11, there seems to be a heightened degree of sensitivity about sharing information. Workshop participants discussed data sharing in a post 9-11 environment.

It was suggested that it was essential to reach a decision process/agreement about data security in advance of an emergency. Critical databases and datasets should be identified before an event and arrangements worked out with the private sector so that the data can be used in emergency circumstances.

Data owners may agree to a different license according to circumstances. In some cases, they may ensure the right to share data with others in an emergency and in compliance with any Memoranda of Agreement/Memoranda of Understanding

(MOAs/MOUs). In other cases, licensing provisions may be circumvented in an emergency by executive order.

Another suggestion was to create a patterned, attorney-approved MOU for this purpose and to put the appropriate contingencies in the licensing agreement.

If there is a one-way flow of data from the public to the private sector, data sharing is not an issue. The private sector adds the value (additional attributes, etc.).

Private sector data owners may be willing to provide “information” vs. raw data. One technique may be to give public data to an employee of the private company that is unwilling to share data and let him or her perform the actual analysis. The employee can then share results, or “information,” with the public agency requesting it. Data owners who are unwilling to share data find this scenario preferable to sharing raw data. In most cases, they are afraid the requesting agency/state may not know how to use the raw data.

It was pointed out that data provided through the Protected Critical Infrastructure Information Program are not available to public discovery, but that the level of trust varies in industry. There is a need for some case law to be developed as a consequence of litigation or challenges in front of actual judges to prove whether the protection guarantees work.

One significant hurdle identified was that “my data” by itself is not a security issue and “your data” by itself is not a security risk. However, when “our data” are put together or stored in the same place, a security risk could be created.

Participants also discussed the use of the military classification system for information in a post 9-11 environment. It was pointed out that people need help recognizing the differences between such terms as classified, protected, for official use only

(FOUO), confidential, business confidential, and proprietary. There is often confusion regarding the different levels of classification and the best ways to protect data. More guidelines are needed on how to classify and secure the data. It was pointed out that it is important to remember that it is not only about having a clearance but also about the need to know information.

It was recommended that American National Standards Institute (ANSI) Guidelines for Protected Data be reviewed. These may provide some additional insight into the issue.

It was noted that clearances are only issued by the federal government and that getting state and local people cleared can be a challenge. In addition, once people have obtained clearances, it is hard retaining them: they receive offers that promise better pay, benefits, and/or working conditions. Having a clearance is important and companies know this.

One participant observed that, due to all the confusion and frustration, people tend to adopt the simple approach and do not share anything.

Technical Challenges

One aspect of the technical challenges to data sharing is the benefit of and/or need for national standards.

It is important to define what standards may be needed. Imagery and roads with address data are probably the two most important. The standards should include the basic core attributes that are needed.

Another participant stated that guidelines are needed on what needs to be standardized. Perhaps it is not necessary to standardize whole datasets, but rather to develop guidelines and best practices.

One proposal was to investigate whether it was possible to use some existing standards like those developed by the USGS or ANSI. Another participant asked about adopting an international standard. He said Environmental Research Systems Institute (ESRI) products are being used almost everywhere and asked about adopting ESRI design standards. One participant strongly objected to any “standards” based on vendor products. Vendors should support open standards, such as those produced by the Open Geospatial Consortium (OGC).

Another proposal was to define a “National System” by bringing together a group that is composed of half government and half private sector supplier representatives. This group would be tasked with developing the standards. The proposed standards would stand a better chance of gaining acceptance because of the involvement of both the public and private sectors. Standards that are designed with the right representation can create larger opportunities for private sector partners and developers.

One participant suggested that both proposals be considered or at least have representation between the AHC and the ANSI Homeland Security Working Group Panel to address the issue of standards.

Several participants pointed out that it is currently possible to convert data to almost any format. What should be the focus of standardization? Some suggested starting with a minimum set of standards rather than trying for the “whole kitchen sink.” Others were dubious about the likelihood of success with a standards-based approach and posed questions of how to deal with the non-compliant groups. It was suggested that we cannot let the lack of standards or their slow rate of adoption prevent us from developing applications.

Non-Technical Challenges

The development and maintenance of partnerships is a key factor in overcoming the non-technical challenges to data sharing. Data-sharing issues are not as great a factor when there is a personal relationship in place between those sharing data. Members of partnerships can work to align datasets over time, thereby creating a more reciprocal relationship. A regional GIS working group can help build these relationships and facilitate data sharing.

One hurdle identified involved funding and mindset that “if we fund something (i.e., a project, data set, collection, maintenance), why are we sharing it with someone else (group, agency, county, region, state)?”

Another non-technical hurdle is the mindset that says, “By the time I go through all the red tape and bureaucracy, I could do it myself.”

It was suggested that it is important to be aware of political changes. New government leaders can change priorities and can affect established formal relationships.

There is a need for communication because currently, there are a lot of single agency or “stovepiped” applications.

Integrating GIS into State/Multistate Exercises

Several of the state presenters identified the need to incorporate GIS into emergency preparedness exercises.

One of the participants suggested using agreements currently in place to run exercises while making an effort to include GIS in the exercise and to see where gaps exist.

Another participant pointed out the need for a feedback loop from the people who

respond to an incident to the people who maintain GIS data to help plan for making data better and more useful. It was also recommended that After Incident Reports are needed that provide feedback to both the GIS community and to the emergency management community. These reports should include such information as:

- What data did you find you did not have that you could have used?
- Which data were most useful to you?
- Which data were not as useful as they could have been?

- How did you use the data that you had in the GIS realm?

Another suggestion offered was to develop a way to store historic versions of data used during incident response and to conduct analytical reviews of the events to determine what data were used and were useful during the response.

The need to retain scalability on data was identified. Data should be applicable to planning, training, the conduct of exercises, and response. However, it was noted that there can be a significant difference in the data that may be needed to support planning versus that needed for incident response and/or recovery activities.

REGIONAL FINDINGS AND RECOMMENDATIONS

The following findings and recommendations are the result of review and analysis of the information provided prior to and during the workshop.

GIS Integration into Emergency Management/Homeland Security Programs

Finding 1: The keys to success are community, teamwork, partnership, and respect. Partnerships and personal relationships are a leap of faith.

Recommendation 1: Encourage and provide the means for developing partnerships and personal relationships among the GIS community and the emergency management/homeland security community within states and on a regional, multistate basis. Also include the opportunity for representatives from other state agencies, federal agencies, and the private sector to become involved in the building of partnerships.

Finding 2: The degree of GIS integration into emergency management/homeland security programs varies across the eight states and the District.

Recommendation 2a: Conduct a series of webinars on the current and planned use of GIS in state emergency management/homeland security programs.

Recommendation 2b: Encourage and provide opportunities for the GIS community to develop a high level understanding of emergency management/homeland security information needs.

Recommendation 2c: Develop an understanding of the National Shelter Survey data and how it could be used to

support each state's catastrophic preparedness planning efforts.

Recommendation 2d: Develop an understanding of how GIS can be used (or currently is being used) to support each state's planning for special needs populations.

Finding 3: Most GIS effort within emergency management/homeland security programs is focused within the state. In a few cases, GIS was used to support state personnel (e.g., National Guard, Urban Search and Rescue Teams) deployed to support another state's response. One state has deployed GIS staff to another state through the Emergency Management Assistance Compact (EMAC). Little need was identified by any of the states to provide emergency management data to adjoining states during actual incidents that had multistate impact.

Recommendation 3a: Determine whether there is an actual need to share GIS information among adjoining states during actual incidents that have multistate impacts, such as flooding, certain terrorism incidents, or hurricane impacts.

Recommendation 3b: If there is a need to share GIS information with adjoining states, develop a consensus about the type of information needed and how the information will be shared.

Finding 4: Often, GIS is seen as a "tool" in the emergency management/homeland security community rather than as a "framework" for program development, management, and implementation.

Recommendation 4a: Develop an education program that presents the argument for using GIS as a program framework rather than as just another tool in the box. Design the program for mid-level and senior management in emergency management/homeland security. This program should include a review of the way

GIS is categorized as a “planning” element in the Incident Command System (ICS), rather than as a tool to support logistics and/or operations.

Recommendation 4b: Develop more of a common operating infrastructure rather than focus on a common operating picture. The focus should be on building data infrastructure not on building applications. GIS data should be built/developed to work with all types of applications.

Finding 5: In most state emergency management/homeland security programs, GIS is primarily used as a tool to produce images or visual aids rather than as a tool for modeling and analysis.

Recommendation 5a: Increase training and the use of GIS modeling and analytical capabilities on a daily basis.

Recommendation 5b: Develop better, faster, and stronger modeling tools. State GIS coordinators have data, know where data are, and have partners to develop data. However, they need help to bring that data to emergency management/homeland security programs and to develop and implement models that support those programs.

Finding 6: Many states are requesting GIS support to develop realistic training exercises as well as to provide support during the exercise. It is important to exercise and train with partners and data that would be used in an actual emergency.

Recommendation 6a: Incorporate GIS into statewide and multistate emergency preparedness exercises. Make formal requests to incorporate GIS staff into exercise design teams through the appropriate chains of command.

Recommendation 6b: Incorporate GIS into exercises that involve both EOC staff and first responders. Include GIS support to field operations as an exercise objective.

Recommendation 6c: Design a tabletop or functional exercise that focuses on the use of GIS. Consider the possibility of a FEMA-sponsored regional exercise.

Finding 7: Several states identified the need for protocols and procedures for sharing GIS data between FEMA and states on a near real-time basis during Stafford Act responses.

Recommendation 7: Review existing protocols and procedures for GIS data sharing between FEMA and the states. Identify gaps and areas of conflicting policies or requirements. Develop GIS information-sharing protocols and procedures that are agreeable to both FEMA and the states.

Data Sharing and Data Standards

Finding 8: Currently, there is little formal GIS data sharing among states. Normally, the state GIS Coordinator is responsible for interstate coordination through membership and participation in such organizations as the National States Geographic Information Council (NSGIC) or regional coordination groups.

Recommendation 8a: The GIS Coordinators from the eight states and the District that sponsor the AHC form a regional “Mid-Atlantic” GIS coordination group. Forming this forum or working group as a subset on an existing group should be considered.

Recommendation 8b: The “Mid-Atlantic” GIS coordination group should learn how GIS is used by each member’s jurisdiction and encourage coordination and data sharing among the member jurisdictions.

Recommendation 8c: Develop a strategy and supporting tools needed to educate elected officials and senior appointed officials about the capabilities and benefits

of a strongly supported and consistently funded GIS program.

Finding 9: There is no consensus among workshop participants about what data should be included in national GIS standards. Some people argued for a very specific and detailed set of requirements that were developed by the federal government. Others supported the idea of a more limited dataset that included items such as imagery, standardized addressing, and transportation information. Another group suggested adopting existing

standards. And finally, several participants questioned the need for standards since it is currently possible to convert data to almost any format.

Recommendation 9: Review the current status of the development of national GIS data standards. Include, among others, activity by the USGS, DHS, ANSI, and OGC.

▶ Section 1

▶ Section 2

▶ Section 3

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APPENDIX A — ACKNOWLEDGMENTS



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- [Maryland](#): Mr. Kenneth Miller, Geographic Information Officer, Maryland Department of Natural Resources
- [New Jersey](#): Mr. William Chavan, GIS Specialist, New Jersey Office of Homeland Security & Preparedness
- [New York](#): Mr. William F. Johnson, Assistant Deputy Director, Operations, NYS Office for Cyber Security & Critical Infrastructure Coordination
- [North Carolina](#): Mr. Kenneth Ashe, Assistant Director of Geospatial Technology Management, North Carolina Emergency Management Agency
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